



A PRELIMINARY REVISION OF SOME GENERA BELONGING TO THE
DIPTERA BRACHYCERA OF AUSTRALIA.

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(Sixteen Text-figures.)

The chief purpose of this paper is to define some genera of the *Diptera Brachycera*. Hitherto, many of these genera were based upon individual species and some specific characters were used for generic determination, or else a number of heterogeneous species were grouped together under one generic name as they possessed in common some character of but trivial importance.

No attempt has been made to establish synonymy amongst genera having characters identical with those given in this paper, as further study may yet elucidate discriminative characters.

A study of the antennae of species belonging to the subfamily *Dasypogoninae* has provided new characters of generic value, and an entirely new interpretation is given to those characters which were previously published.

New species are only described where they are required to illustrate remarks and criticisms made under their respective genera and new synonyms to species are recorded wherever found.

The outlines of the revised taxonomy proposed here were based upon the study of various collections, the most important of which are in the Macleay, Australian and Queensland Museums, and in the Agricultural Department of Queensland. Various private collections, including that of Dr. E. W. Ferguson, were also examined.

Acknowledgements.—Much of this paper was based upon facts gathered together during the preparation of my previous papers and consequently the same sources of help are again gratefully acknowledged. In addition, thanks are due to Mr. H. A. Longman, Director of the Queensland Museum, and to Mr. Henry Tryon, Entomologist of the Agricultural Department, Queensland, for permission, so readily granted, to examine the collections under their charge.

Family LEPTIDAE.

Note.—White (1914) proposed the genus *Clesthentia* which he placed in the *Leptidae*. Subsequently it was revised, still under this family, by me (1919). A further study of the genus has convinced me that White misplaced his typical species which has characters that conform better to those of the family *Therevidae*, under which see further remarks.

Genus SPANIOPSIS White.

Types.—In 1915, under this genus, Dr. E. W. Ferguson described four species of flies, the holotypes of which were stated to be in the Microbiological Laboratory of the Department of Public Health. While Dr. Ferguson was absent on war-work in Europe, these specimens were attacked by *Anthrenus* and now only two holotypes are left, both of which have since been placed in the Australian Museum, where they will have the advantage of being continuously under the charge of an entomologist.

In 1919, in a paper "The Australian Rhyphidae and Leptidae" I based the identity of species, described by Dr. Ferguson as belonging to this genus, upon the paratype material in the Australian Museum as the types, then in the Health Department, were not available.

The following list of specimens in the Australian Museum contains all those deposited there that were used in various papers dealing with this genus.

S. tabaniformis White; holotype and one paratype.

S. verans Ferguson; (holotype lost); two paratypes and one other specimen.

(Possibly this is not specifically distinct but represents a smaller form of the previous species).

S. clelandi Ferguson; holotype, two paratypes and one other specimen.

S. marginipennis Ferguson; holotype, one paratype and four other specimens.

S. longicornis Ferguson; (holotype lost); one paratype and two other specimens.

Distribution.—This genus has evidently a wide distribution over Australia, as there are specimens from Western Australia in the Macleay Museum. Also Dr. Ferguson has recently received specimens from that State. The various species appear to be met with most frequently in June, and I have taken as many as three of them during one day in a small part of a valley at Heatheote, New South Wales, where they were swarming, not only in the valley, but also on the summit and slopes of the hills on each side.

On the same occasion I swept bushes in the endeavour to secure males but failed to find any specimens showing characters of a secondary sexual nature.

There are some males however from Western Australia in the Macleay Museum, and they have contiguous eyes.

Family ASILIDAE.

Notes.—Miss Ricardo's revision (1912-13) of the Australian *Asilidae* does not contain a revision of the genera into which the species were placed, and the new genera she proposed lack characters by which they can be adequately defined. Her keys to the genera contain characters of specific value and her arrangement of these is misleading.

Two of the four subfamilies of the *Asilidae* are revised here and the majority of the genera within them are defined. The definitions are based upon Australian material and, wherever possible, on the typical species.

Subfamily DASYPOGONINAE.

Notes.—The number of genera indigenous to Australia belonging to this subfamily exceeds those in the other three subfamilies of the *Asilidae* together. They have been so poorly studied that scarcely any definitions are to be found in the literature and, as most of the genera appear to be restricted to Australia

or the Australian region, little assistance for determining them is to be found in the works on the *Asilidae* of other countries.

In this revision, primary characters only are dealt with and these group the genera into convenient sections. The characters differentiating the genera within these sections will be found under their respective generic headings.

The exoskeleton shows differences of generic value in the characters discussed below.

Antennae. The antennae contain three joints and an appendage of one or two vestiges of joints. These vestiges have been called the style and the first may be absent; the second vestige is invariably indicated, often very minutely so, and it is spine-like.

A study of the antennae of the various genera of the *Dasypogoninae* has convinced me that the first vestigial joint, which is sometimes long and conspicuous, should be called the fourth joint, and the second spine-like vestigial joint should be called the fifth.

If the fourth joint becomes obsolete, by being amalgamated with, or in any other way indistinguishable from, the third, then the fifth joint will appear to be on the third, usually in the form of a spine.

Invariably the fifth joint is indicated; either it is contained within a depression on the extreme apex, as illustrated in Text-figures 3, 5, 6 and 7, or it is contained within an apical incision placed dorsally and occurs either on the fourth joint or on the third, as illustrated in Text-figures 4 and 8 respectively. Sometimes the fifth vestigial joint is obscure and difficult to find.

Thorax. Two genera have a pair of spines on the thorax, one placed on each side, a little above the wings. This character appears to be most important, as the species which possess it also have an elongate neck and the wings placed well beyond half the length of the thorax (Text-fig. 1); these characters give the species the very characteristic appearance they all possess.

Legs. The anterior tibiae in some of the genera contain a spur at the apex. This spur has been used to divide the genera into two groups, in one of which the spur is missing, but in this paper the character is derogated to a position of less importance.

Wings. The venation is somewhat variable, even within a species, but in a few genera the fourth posterior cell is closed considerably before the wing margin. In the remaining genera it is open, or at most closed on the wing margin. The character appears to be important and is here placed second in value to that of the thoracic spines.

Key to the genera of the Dasypogoninae.

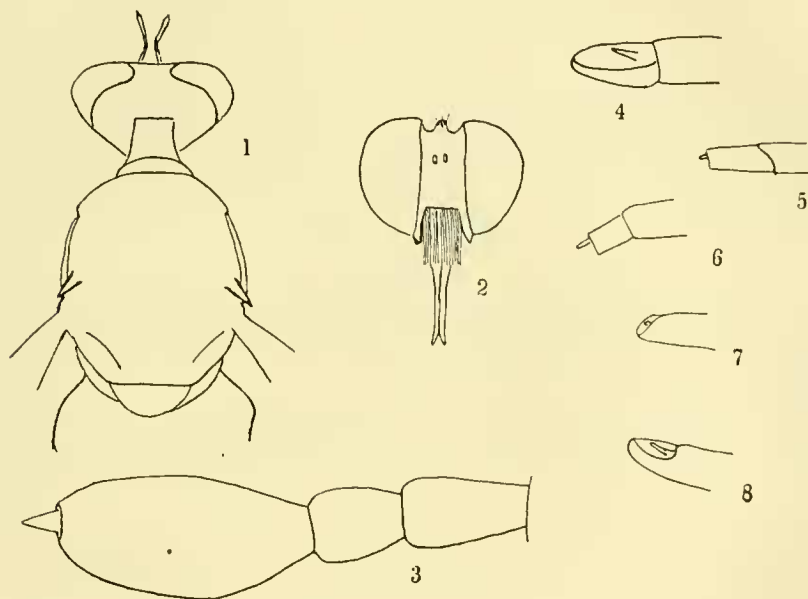
1. Thorax with a pair of lateral spines, one placed on each side a little above the wings 2
 Thorax without such spines 3
2. Antennae with a two-jointed style consisting of the fourth and fifth antennal joints *Chrysopogon*
 Antennae with a one-jointed style consisting of the fifth antennal joint in the form of a strongly developed apical spine *Opseostlengis*
3. Wings with the fourth posterior cell closed considerably before the wing margin 4
 Wings with the fourth posterior cell open, or at most closed on the wing margin 5

Note.—The genus *Phellus* is represented in Australia by one described species and a second, undescribed, which differs in the absence of the prolongation of the intermediate tibiae. In the Australian Museum each form is represented by a female; in the Macleay Museum there are two males of the undescribed species and a pair of *P. glauens* Walker. The males contain abundant yellow hair on the abdomen and are very dissimilar in appearance to the females.

Genus *PSILOZONA* Ricardo.

Type, *P. albitarsis* Ricardo. Queensland.

Characters.—The antennae have a conspicuous fourth joint. The anterior tibiae are without a spur. The wings have the fourth posterior cell closed considerably before the wing margin.



Text-figs. 1-3. *Opseostlengis insignis* White, holotype. 1. Thorax; 2. Head seen anteriorly; 3. Antennae seen laterally.

Text-figs. 4-8. The apices of the antennae in various genera of the *Dasypogoninae*. 4. *Chrysopogon*, showing the fourth and the fifth spine-like joints; 5. *Phellus*; 6. *Saropogon*; 7. *Neocyrtopogon*, showing the absence of the fourth joint and the minute fifth in the apical depression of the third; 8. *Codula*, showing the fifth spine-like joint in an incision on the dorsal side at the apex of the third.

Note.—These characters are deduced from Miss Ricardo's descriptions and they conform to those of the genus *Phellus*, but, however, *Psilozona* differs in having the sexes similar in appearance.

Genus BATHYPOGON Loew.

Type, *B. asiliformis* Loew (= *aoris* Walker). Australia.

Characters.—The antennae have the fourth joint absent; the first joint is longer than the second. The anterior tibiae are without a spur. The wings have the fourth posterior cell closed considerably before the wing margin.

Notes.—Seven supposedly distinct species are recorded under this genus and the species so far examined cannot be adequately identified by the published descriptions which are based chiefly upon minor colour characters.

Genus DEROMYIA Phillipi.

Type, *D. gracilis* Phillipi. Chile.

Characters.—The antennae are without the fourth joint. The anterior tibiae contain an apical spur. The wings have the fourth posterior cell closed considerably before the wing margin.

Genus ERYTHROPOGON White.

Type, *E. ichneumoniformis* White (= *maculinevris* Macquart). Tasmania.

Characters.—The antennae have the fourth joint apparently present but, owing to the short bristly vestiture with which the apex is covered, the division between the third and fourth joints is not distinct. The anterior tibiae contain an apical spur. The wings have the fourth posterior cell open. The abdomen is club-shaped.

ERYTHROPOGON MACULINEVRIS Macquart.

Dasypogon maculinevris, Macquart, Dipt. Exot., suppl. 4, 1850, p. 65, Pl. vi., fig. 8.—*Brachyrrhopala maculinevris*, Roder, Wien. Ent. Zeit., ii., 1883, p. 273.—*B. maculinevris*, Roder, Stett. Ent. Zeit., liii., 1892, p. 242.—*Erythropogon ichneumoniformis*, White, Proc. Roy. Soc. Tasm., 1913, p. 270; *Id.*, 1916, p. 159, text-fig. 26.

Synonymy.—Miss Ricardo placed *Dasypogon maculinevris* Macquart as a synonym of *Brachyrrhopala limbipennis* Macquart, notwithstanding the fact that Roder had already published a revised description of the species for which he claimed very distinct characters.

Roder's description conforms very well with White's species and, moreover, Macquart's description and figure agree with this species better than with *B. limbipennis*.

Hab.—Tasmania: Hobart, 28th March, 1915; Mt. Maria, 7th February, 1918.

Genus SAROPOGON Loew. (Text-fig. 6).

Type, *Dasypogon luctuosus* Meigen. Europe.

Characters.—The antennae have the fourth joint present. The anterior tibiae contain an apical spur. The wings have the fourth posterior cell open.

Note.—Under the species *Saropogon sergius* Walker, Miss Ricardo states that "From the description of *Dasypogon nitidus* Macquart, from Tasmania, it is possibly the same species as this" and yet in the same work she had previously placed this species under the genus *Brachyrrhopala*.

This discrepancy has been allowed to stand unchallenged in all subsequent references and *Dasypogon nitidus* Macquart has remained in the genus *Brachyrrhopala* where it does not belong.

The generic position of the species is undoubtedly nearer to the genera *Saropogon* and apparently it is not identical with *S. sergius* Walker.

Genus NEODIOCTRIA Ricardo.

Type, *N. australis* Ricardo. New South Wales.

Characters.—The antennae have the fourth joint present. The anterior tibiae are without a spur. The wings have the fourth posterior cell open.

Genus STENOPOGON Loew.

Type, *Asilus sabaudus* Fabricius. Europe.

Characters.—The antennae have the fourth joint present. The anterior tibiae are without a spur. The wings have the fourth posterior cell open.

Note.—The above characters conform to those given under the genus *Neodioctria*, but both the genera have their own very characteristic appearance. Moreover, the Australian species of this genus differ from all the others in having globular male genitalia.

Genus CRYPTOPOGON White.

Type, *C. vernaculus* White. New South Wales.

Characters.—The antennae have the fourth joint present. The anterior tibiae are without a spur. The wings have the fourth posterior cell open. There is an extra cross vein situated between the upper branch of the cubital fork and the radial vein; the presence of this vein separates this genus from all the others.

Genus NEOSAROPOGON Ricardo.

Type, *Dasyopogon princeps* Macquart. New South Wales.

Characters.—The antennae are without the fourth joint. The anterior tibiae contain an apical spur. The wings have the fourth posterior cell open.

Note.—The genus differs from *Brachyrrhopala* by the abdomen not being club-form; and from *Neocyrtopogon* by the face not being very convex.

Genus NEOCYRTOPOGON Ricardo. (Text-fig. 7.)

Type, *N. bifasciatus* Ricardo. Queensland.

Characters.—The antennae are without the fourth joint. The anterior tibiae contain an apical spur. The wings have the fourth posterior cell open.

Notes.—The very convex face is the only character published that distinguishes this species from its allies.

In the Macleay Museum there is a species belonging to this genus that has a conspicuously club-form abdomen; the typical species and also others examined have the abdomen normal in shape.

Genus CABASA Walker.

Type, *C. rufithorax* Walker (= *pulchella* Macquart). Tasmania.

Characters.—The antennae are without the fourth joint. The anterior tibiae contain an apical spur. The wings have the fourth posterior cell open.

Note.—There does not appear to be any reliable character to separate this genus, which contains one described species, from *Brachyrrhopala*. The species belonging to the genus never have the hard integuments and the compact knob

of the abdominal club, like those species belonging to the genus *Brachyrrhopala* and, indeed, only some have the abdomen at all resembling a club.

Genus *BRACHYRRHOPALA* Macquart.

Type, *B. ruficornis* Macquart. Tasmania.

Characters.—The antennae are without the fourth joint. The anterior tibiae contain an apical spur. The wings have the fourth posterior cell open. The abdomen is conspicuously club-shaped, containing a restricted basal portion and a compact apical portion rounded at the apex. The integuments of the abdomen are hard and do not shrivel or collapse when dried, as they do in species of *Cabasa* which have a club-shaped abdomen.

Notes.—The species hitherto known as *Brachyrrhopala nitidus* Macquart, does not belong to this genus; it is allied to the genera *Saropogon*.

The species hitherto known as *Brachyrrhopala limbipennis* Macquart also does not belong to this genus; it is nearer to the genus *Erythropogon*, but differs considerably in the antennae and may represent a new genus.

Genus *CODULA* Macquart. (Text-fig. 8).

Type, *C. limbipennis* Macquart. New South Wales.

Characters.—The antennae are without the fourth joint. The anterior tibiae are without a spur. The wings have the fourth posterior cell open. The abdomen is club-form.

Subfamily ASILINAE.

Notes.—A paper by White was published in 1917 and in it the Australian genera of the subfamily were given a better taxonomic treatment than that given by Miss Ricardo. The one outstanding feature of White's paper was the elimination of various genera that do not occur in Australia. There are, however, characters taken to be of generic value that do not conform to all the species within the various genera included in White's key.

In the first key given below the genera are grouped into sections according to what is taken to be their primary characters. One of these sections contains three genera that appear to be closely related, although they diverge widely in appearance. Remarks concerning them will be found under their respective descriptions.

The second key can be utilised for the purpose of placing any species into its genus and will be found very easy to use.

For convenience, the more obscure divisions are treated here as subgenera. On this account the names *Neoaratus*, *Trichotamus* and *Rhabdotitamus* do not appear in the keys, but a few remarks upon them will be found under the genera to which they are respectively referred.

Key to the genera of the Asilinae showing supposed affinities.

1. Wings with three submarginal cells *Promachus*
 Wings with two submarginal cells 2
2. Female abdomen with the apical segment cylindrical and in no way different
 from the others 3
 Female abdomen with the apical segment black, shining, bare of tomentum
 and more or less compressed *Blepharotes*; *Pararatus*; *Neotitamus*
3. Antennae with the arista bare *Asilus*
 Antennae with the arista pectinate *Ommatius*

Alternative key to the genera of the Asilinae.

1. Antennae with the arista pectinate *Ommatius*
 Antennae with the arista bare 2
2. Wings with three submarginal cells *Promachus*
 Wings with two submarginal cells 3
3. Abdomen very depressed and broad, and with lateral tufts of hair .. *Blepharotes*
 Abdomen cylindrical 4
4. Female with the apical abdominal segment or segments bare of tomentum,
 shining and usually strongly compressed 5
 Female with the apical abdominal segment never bare or compressed, always
 cylindrical and covered with hair and tomentum similar to that on the other
 abdominal segments *Asilus*
5. A large black species with a yellow abdomen *Pararatus*
 Small grey, black or brown species *Neoitamus*

The genera *Philodiceus*, *Proctacanthus* and *Erax* have not been recognised in the collections examined.

Genus *PROMACHUS* Loew.

Type, *Asilus maculatus* Fabricius. Europe.

Characters.—The wings have the cubital vein branching before it reaches the radial vein. These branches run parallel and close together for a considerable distance but diverge widely before reaching the margin of the wing. There is a cross vein dividing the area enclosed by the cubital fork at about three-fifths its length, making in all three submarginal cells.

Genus *BLEPHAROTES* Westwood. (Text-figs. 9-12).

Type, *B. abdominalis* Westwood (= *splendidissima* Wiedemann). New South Wales.

Characters.—The abdomen is depressed, very broad and contains tufts of hairs along the whole length of its lateral borders. The apical segment of the female abdomen is more or less compressed, bare of tomentum and shining black. The wings have the normal two submarginal cells.

Notes.—Under the name *Blepharotes corarius* Wiedemann, a number of species have been confused. They all have a similar colour, but they differ remarkably in the characters of the male genitalia, and to a limited extent in the proportions of the antennae and in markings. Miss Ricardo described a species with a yellow abdomen under the name *B. flavus*, and probably the series of specimens recorded by her under this name also contains more than one species.

The four drawings given here represent the male genitalia of a few of the specimens and two of these, in which the sexes have been taken *in copula*, are described as new, as they probably do not conform to the typical species described by Wiedemann.

The other species described from Australia is *B. vivax* Hermann and is represented by two females in my collection; besides the bright thorax this species also has a differently shaped abdomen.

B. aterrima Hermann from New Guinea, the only species described outside Australia, is unknown to me.

BLEPHAROTES PUNCTATUS, n. sp. (Text-fig. 10).

Description.—This species is one of a series that previously has been confused with *B. corarius* Wiedemann. The antennae have the style as long as the third joint. The thorax contains a pair of white tomentose spots at the apices of the transverse suture. The genitalia of the male conform to Text-figure 10.

The head is brownish and more or less covered—the face is completely covered—with a yellowish white tomentum; the hair on the front is black; the moustache and beard are of the same colour as the face. The eyes, proboscis, palpi and the hairs on the latter are black. There is a row of black bristles behind the eyes. The antennae have the first joint a little longer than the second and the third joint is one and a half times the length of the basal joints united; the style is as long as the third joint.

The ground colour of the thorax is brown and the scutellum is similarly coloured. There is some white tomentum at the sides of the thorax and there are also two pairs of white tomentose spots, one situated at the apices of the transverse suture and the second just above the scutellum. All the bristles and the hairs are black.

The abdomen is yellowish-red and contains a pair of black lateral tufts of long hair on each segment. The third to eighth segments have a few white hairs on the anterior side of each tuft.

The male genitalia are large, black, abundantly covered with long bristly hairs and are of the form shown in Text-figure 10. The upper forceps have a small process on the upper edge, and the apex is broadly truncate; the lower forceps are simple, and contain the apical emargination which is usually present.

The female ovipositor is shining black and is considerably compressed but, however, it contains a dorsal and ventral surface.

The hairs on the anterior and intermediate coxae are white; the legs are entirely black and, with the exception of the above, they have all the hairs and bristles black; the pulvilli are brown.

The wings are uniformly suffused dark brown.

Length.—The male is 33 mm. and the female 35 mm.

Hab.—Queensland; Jandowae, December, 1920 (collected by R. Illidge); one pair taken *in copula*.

Types.—The male holotype and the female allotype are in my own collection.

BLEPHAROTES BRISBANENSIS, n. sp. (Text-fig. 9).

Description.—This species is one of a series that has previously been confused with *B. corarius* Wiedemann. The antennae have the style only a quarter the length of the third joint. The male genitalia are as shown in Text-figure 9.

The head is black and has some white pubescence on the front; the tomentum on the face is light yellowish and the moustache and beard are of the same colour. The eyes, proboscis, palpi and the hairs on the latter are black. There is a row of black bristles behind the eyes.

The antennae have the first joint a little longer than the second and the third two and a half times the length of the first and second together; the style is a quarter the length of the third joint.

The ground colour of the thorax is black and there is some white lateral tomentum.

The abdomen is yellowish red and on each segment there is a pair of black lateral tufts of hair. The third to eighth segments have a few white hairs on the anterior side of each tuft.

The male genitalia are large, black, abundantly covered with black bristly hairs and are of the form shown in Text-figure 9. The upper forceps have a blunt process on the upper edge and the apex is pointed. The lower forceps are simple.

The female ovipositor is black, shining and considerably compressed.

The hairs on the anterior and intermediate coxae are white. The legs are entirely black and, with the exception of the above, they have all the hairs and bristles black; the pulvilli are brown.

The wings are uniformly suffused dark brown.

Length.—34 mm.

Hab.—Queensland: Mt. Coot-tha, Brisbane, 19th December, 1920. A pair taken in copula.

Types.—The male holotype and the female allotype are in my collection.

Genus PARARATUS Ricardo.

Type, *Blepharotes macrostylus* Loew. Western Australia.

Characters.—The abdomen is cylindrical and the female has the apical segments more or less compressed, similar to the compressed abdomens of some species of the genus *Neoitamus* but the lamella appears to be differently constructed. This lamella seems to be composed of three separate plates, one lying horizontally and the other two placed above it in such a manner that the apical borders of the three plates form a triangle. The lamella widens towards the apex. The wings have the normal two submarginal cells.

Genus NEOITAMUS Osten-Sacken.

Type, *Asilus cyaneus* Loew. Europe.

Characters.—The abdomen is cylindrical. The female has the apical segments more or less compressed and the lamella is apparently simple. In one species retained within this genus there are apparently two small separated lamellae on the female abdomen. The wings have the normal two submarginal cells.

Note.—The genera *Rhabdotoitamus* and *Trichoitamus* were described by White on characters of insufficient importance to warrant them being accepted as of generic rank. Too little is yet known about this obscure group to form satisfactory definitions or even to suggest any difference between the genera proposed by White.

NEOITAMUS ABDITUS White.

Hab.—New South Wales: Grenfell, April 1921; collected by Miss E. C. Horrocks. This record adds a new State to the range of this species.

NEOITAMUS NEOCLARIPES, n. sp.

Neoitamus claripes, Hardy (*nec* White), Proc. Linn. Soc. N.S. Wales, xlv., 1920, p. 197, Text-fig. 11.

Synonymy.—I am indebted to Major E. E. Austen who has kindly compared my figures of the genitalia in These Proceedings (Vol. xlv.) with some of the type specimens of the genera *Asilus* and *Neoitamus* in the British Museum.

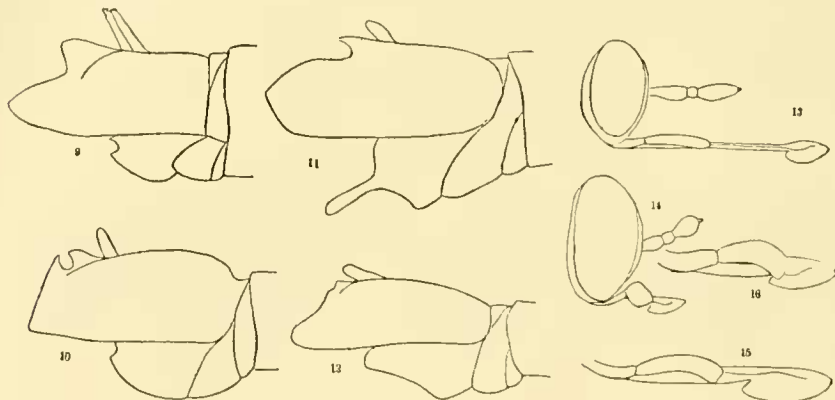
Of this species Major Austen writes.—“The forceps in the type are much less elongate than they appear in figure 11; they are not attenuated towards the distal extremity as in the figure.”

Evidently my identification of White's species is incorrect and it is necessary to give a new name to the species I previously described under White's name.

Genus *ASILUS* Linnaeus.

Type, *Asilus crabroniformis* Linnaeus. Europe.

Characters.—The abdomen is cylindrical and in the female the apical segments do not differ in any respect from the basal segments. The wings have the normal venation with two submarginal cells.



Text-figs. 9-12. The male genitalia of various species belonging to the genus *Blepharotes*. 9. *B. punctatus*, n. sp.; 10. *B. brisbanensis*, n. sp.; 11. A species from Perth, Western Australia, which has a yellow abdomen, and an apical process on the lower forceps; 12. A species from Perth with a yellowish-red abdomen and comparatively small genitalia unique in having no prominent characters.

Text-figs. 13-16. Parts of the head of various species belonging to the genus *Apiocera*. 13. Head of a male specimen from Perth, Western Australia, which specimen has very long antennae, palpi and proboscis; 14. The head of a male from Sydney in which the head appendages are short; 15. The palpi and proboscis of a species from Perth which has the colour pattern of *A. moerens*, as illustrated by Westwood; 16. The palpi and proboscis of a male specimen from Sydney.

Note.—The subgenus *Neouratus* is formed for a species that differs from the others by having part of the costa produced forward.

Genus *OMMATIUS* Wiedemann.

Type, *Asilus marginellus* Fabricius. North America.

Characters.—The antennae have the arista pectinate and in this respect the genus differs from all the others. The abdomen has the apical segments similar to the basal ones. The wings have the normal venation with two submarginal cells.

Family APIOCERIDAE.

Historical.—In 1830, Wiedemann described *Laphria brevicornis*. In 1838 (pt. 2, p. 78) Macquart proposed the genus *Tapinocera* for Wiedemann's species without seeing it, and he retained the genus within the family *Asilidae*. Later, in 1847, Macquart described and illustrated *Pomacera bigotii* from Tasmania and did not recognise his genus *Tapinocera* in the species.

Westwood described *Apiocera fuscicollis* and *Apiocera asilica* in 1835; in 1841 he added *A. moerens* and at the same time made the statement that he was not satisfied with the specific diversity of the three species. He also mentioned that his specimen of *A. asilica* was in a very mutilated state.

In 1854, Walker placed *P. bigotii* Macquart as a synonym of *A. asilica* Westwood but, however, as the description given by Walker was that of *A. moerens* and not that of *A. asilica*, it is possible that Walker intended to make Macquart's species a synonym of *A. moerens* Westwood.

In 1883, Osten-Saeken published remarks similar to the above and expressed the opinion that the whole subject required a revision based upon abundant material and added that the genus was represented by four different species which he had seen in collections.

In 1909, Hermann recorded a female of *A. moerens* Westwood from North Borneo and a male from New South Wales; also a male of *A. fuscicornis* Westwood from New South Wales and a female of *A. bigotii* Macquart from Cooktown, Queensland; finally he described a species from Queensland under the name *A. vulpes*.

It is to be regretted that Hermann did not improve upon the descriptions of *A. bigotii* Macquart, *A. fuscicollis* Westwood and *A. moerens* Westwood from the material he had at his disposal as this would have been more useful than adding a new name to the uncertain number of valid species previously described.

Genus APIOCERA Westwood. (Text-figs. 13-16).

Type, *A. fuscicollis* Westwood. Australia.

Characters.—Rather large thick-set flies with three-jointed antennae and a one- or indistinctly two-jointed style. The wings have a complex venation. The costal and subcostal veins meet before the apex of the wing; the mediastinal vein between them reaches to or beyond half the length of the wing. The radial vein runs into the subcostal. The upper and lower branch of the cubital vein runs into the wing margin before the wing apex. The first posterior vein runs to the margin at about the apex of the wing. The second posterior vein runs about parallel to the first but reaches the wing margin considerably after the apex. The third posterior vein meets the fourth, thus closing the fourth posterior cell, before reaching the wing margin. The fifth posterior vein meets the anal at or about the wing margin. The anal vein is slightly sinuous.

The exoskeleton shows differences of specific value in the characters discussed below.

Head: Considerable structural differences are to be found between the species in the proportional length, size and shape of the palpi which are two jointed; in the length of the proboscis; and in the proportional shape and length of the antennae. Text-figures 13 to 16 represent four distinct species that differ widely in these respects.

Genitalia: The genital organs do not show many external characters of specific value. The species usually have simple upper and lower forceps in the males, but one species has the upper forceps of the male genitalia bent downwards considerably at the apex. The females all bear the same number of spines at the apex of the abdomen.

Colour and colour pattern: The colour of species forms a very inadequate determining factor but there are a few outstanding species that differ in this respect from the rest. Also a few species appear to have a unique colour pattern.

Notes.—The above revision of this genus is included in this paper for the purpose of showing that certain characters are of specific value, and it is to be hoped that the remarks may be found useful when the type specimens, all of which are in Europe, are examined. The revision is based upon abundant material, as Osten-Sacken suggested should be done, but without the types it is impossible to carry this revision beyond the point here attained.

Family THEREVIDAE.

Notes.—In the "Thereviden der Indo-Australischen Region" Kroker (1912) has left the taxonomy of the genera, as far as Australia is concerned, in a condition that cannot be considered satisfactory.

In 1915, White revised the *Therevidae* of Tasmania, and pointed out that in classifying the genera the form of the venation of the wing seemed to him to be of great importance.

An independent investigation into a large number of species of *Therevidae* of Australia, including most of the known genera, has led me to the same conclusion as that arrived at by White and, therefore, it is certain that the venation will provide some characters of importance for the proper grouping of the Australian genera.

It is proposed here to divide the Australian *Therevidae* into two groups based upon the open and closed fourth posterior cells, a character sometimes ignored in Kroker's work.

Group 1, containing species with the fourth posterior cell open, includes the genera *Belonalys*, *Taenogera*, *Ectinorrhynchus*, *Anabarrhynchus*, *Platycaenum*, and *Psilocephala*.

Group 2, containing species with the fourth posterior cell closed, includes the genera *Agapophytus*, *Phycus*, *Acatopygia*, *Acupalpa*, *Lonchorhynchus*, *Odenbergia*, *Parapsilocephala*, *Pseudoloxocera*, *Acraspisa* and *Clethentia*.

The genera *Spatulipalpa* and *Eupsilocephala* have not been recognised in the collections examined, and from their descriptions the first contains species with the fourth posterior cell closed and open, and in the second the character is ignored.

Genus BELONALYS Kroker.

Type, *B. obscura* Kroker. New South Wales.

Note.—A primary character given by Kroker and upon which he has founded the genus will be found at the base of the discal cell. The two veins which border this cell anteriorly and posteriorly radiate from a point, so that the base of the discal cell forms an acute angle. A species of this genus, which is represented by two specimens before me, shows that in one specimen the wing character agrees with the above description, but in the other the venation is more

or less normal and therefore this wing-character cannot be considered of generic value.

PHYCUS ?? BASIPUNCTATUS Walker.

Xylophagus basipunctatus, Walker, Trans. Ent. Soc. Lond., iv., 1857, p. 121.—*Erinna basipunctata*, Kertész, Cat. Dipt., iii., 1908, p. 135.

Affinities.—This outstanding description evidently belongs to the *Therevidae*. The antennae are described as having the second joint very short, the third lanceolate and shorter than the first; these characters suggest the genus *Phycus*.

The species has not been recognised in the collections and Kertész left the reference in the family *Erinnidae* under the genus *Erinna* which equals the genus *Xylophagus* of other authors.

Genus PLATYCARENUM Krober.

Type, *P. porrectifrons* Krober (= *quinquevittata* Macquart). Cape York.

Note.—The produced head of the species placed in this genus will distinguish it from those in the genus *Anabarrhynchus*.

PLATYCARENUM QUINQUEVITTATA Macquart.

Thereva quinquevittata Macquart, Dipt. Exot., suppl. 2, 1847, p. 50.—*Thereva arida* Walker, Trans. Ent. Soc. Lond., iv., 1857, p. 133.—*Platycarenum porrectifrons* Krober, Ent. Mitt., i., 1912, p. 244 (Text-fig.)—*Anabarrhynchus pallidus* White, Proc. Roy. Soc. Tasm., 1915, p. 39 (Text-fig. 21).

Synonymy.—The above descriptions undoubtedly belong to the same species which is widely distributed on the eastern coast of Australia and which frequents sand-dunes.

Note.—White's figure does not resemble the shape of the head and antennae in the least. The black spots on the front vary considerably in size and shape.

Hab.—Tasmania, New South Wales and Queensland.

ANABARRHYNCHUS RUFIPES Macquart.

Anabarrhynchus rufipes, Macquart, Dipt. Exot., suppl. 4, 1850, p. 99, pl. ix., fig. 11; White, Proc. Roy. Soc. Tasm., 1915, p. 47; Hardy, Proc. Roy. Soc. Tasm., 1916, p. 207.—*A. terrenus* var., White, Proc. Roy. Soc. Tasm., 1915, p. 45.

Synonymy.—As suggested by White, his coastal variety of *A. terrenus* is not identical with the typical form from the bushlands. From series collected on coastal sand-dunes at Bellerive, near Hobart, it is found that there are grades between the typical species of *A. rufipes*, as identified by myself, and the variation described by White under *A. terrenus*.

ANABARRHYNCHUS TERRENUS White.

Anabarrhynchus terrenus, White (exclusive of variety), Proc. Roy. Soc. Tasm., 1915, p. 45.

Synonymy.—As already stated above, the typical form of this species which occurs in the bush lands is distinct from the species included under this name as a variety. This second species is referred to *A. rufipes* Macquart, and it seems probable that the first, which is the typical species, was previously described by Macquart (1846, p. 104) under the name *Thereva hyalipennis*.

Genus *CLESTHENTIA* White.

Type, *C. aberrans* White. Tasmania.

Affinities.—This genus was originally placed in the family *Leptidae* (White, 1914) and was retained in this family by me in 1919. It is here proposed to transpose the genus to the *Therevidae* on account of its possessing the following characters:—

1. The presence of some more or less distinct thoracic bristles situated laterally and similar to those on other species of *Therevidae*.
2. A closed fourth posterior cell.
3. The absence of a pulvilliform empodium.

All these characters are contrary to those of the family *Leptidae*. A re-examination of the supposed tibial spurs shows them to be apical spines similar to those in other genera of the *Therevidae*.

Family DOLICHOPODIDAE.

ARACHNOMYIA CUPREUS Macquart.

Hydrophorus cupreus, Macquart, Dipt. Exot., suppl. 4, 1849, p. 123, Pl. xii., fig. 2; White, Proc. Roy. Soc. Tasm., 1916, p. 258.—*Arachnomyia arborum*, White, Proc. Roy. Soc. Tasm., 1916, p. 253, text-fig. 50.

Synonymy.—The description of *Hydrophorus cupreus* Macquart agrees in every respect with specimens of *Arachnomyia arborum* White, so undoubtedly Macquart's species will be found identical with White's when the type is examined; both were described from Tasmania where this species is abundant. Moreover, I believe the genus *Hydrophorus* does not occur in Australia; not only have I searched for it in Tasmania, New South Wales and Queensland without success, but also it is not represented in any collection I have seen.

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